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EMERSON (G.B.)

WHAT WE OWE  
TO  
LOUIS AGASSIZ,  
AS A TEACHER.

AN ADDRESS BY  
GEORGE B. EMERSON,

BEFORE THE BOSTON SOCIETY OF NATURAL HISTORY, JAN. 7, 1874.



BOSTON:  
1874.

90 Boylston St.



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MR. PRESIDENT:—

I thank you for the great honor you do me by inviting me to say something before, and in behalf of, your Society, in commemoration of the most distinguished naturalist that has appeared among us. You know how reluctantly I consented to speak, and I feel how inadequately I shall be able to represent the Society. Yet I cannot but admit that there is some apparent propriety in your request. I was one of those who formed this Society. All the others who first met, except one, are gone; Dr. B. D. Greene, Dr. J. Ware, F. C. Gray and the rest. My old friend, Dr. Walter Channing, alone, in whose office most of the first meetings were held, is still living. Moreover, while I was in the seat you now occupy, it was agreed by my associates that it was very proper and desirable that a Survey of the State, Botanical and Zoological, should be made, to complete that begun by Prof. Hitchcock in Geology. At their request I presented to Gov. Everett a Memorial suggesting this.

Our suggestion was graciously received. Gov. Everett brought the subject before the Legislature, in which some friends of Natural History in the House of Representatives had already been acting toward the same end; an appropriation was made, and he was authorized to appoint a commission for that purpose. On that commission four members of this Society were placed; the reports of three of whom, Dr. Harris, Dr. Gould and Dr. Storer, have been, and still continue to be, considered of signal and permanent value, and Mr. Agassiz himself regarded them as among the best reports ever made. It has given and still gives me the greatest satisfaction to know that the Society has been continually going forward, and that it is now more prosperous than ever.

A little more than twenty-seven years ago, as I was sitting in my study, a message came to me that two gentlemen desired to see me. They were immediately admitted, and Dr. Gould introduced me to Louis Agassiz. His noble presence, the genial expression of his face, his beaming eye and earnest, natural voice, at once gained me, and I responded cordially to his introduction. He said, "I have come to see you, because Dr. Gould tells me that you know the trees of Massachusetts; I wish to be made acquainted with the *Carya*. I have found the leaves and fruit of several species in the Jura Mountains, where they were deposited when those mountains were formed; but, since that time, none have been found living in Europe. I want to know them as they are now growing."

I told him that I knew all the species found in New England, and should be glad to show them to him. "But I have," I said, "presently to begin my morning's work. If you will let me call on you immediately after dinner, I shall be glad to take you to them."

At the time fixed, I called on him at his lodgings and took him, in my chaise, first to Parker's Hill, where one species of hickory grew, then through Brookline, Brighton and Cambridge, where two others were found, and to Chelsea, where a fourth, and one that might be a variety, were growing. I pointed out the characteristics of each species in growth, branching, bark, fruit and leaves, and especially in the buds. He listened with the most captivating attention, and expressed surprise at my dwelling upon the peculiarities of the buds. "I have never known the buds to be spoken of as characteristic," said he; "that is new to me." He admitted the distinct peculiarities of structure in the buds; and, I have no doubt, remembered every word I said, for, a few months afterwards, I saw, in a newspaper, that Mr. Agassiz would give a lecture, in Roxbury, on the buds of trees.

We drove on to Chelsea Beach, which stretches off several miles, — apparently without end, — and, as the tide was very low, was then at least a quarter of a mile wide. He was charmed with everything, expressing his pleasure with all the earnestness of a happy child, hardly able to restrain himself in his admiration and delight. He told me that he had never



before been on a sea-beach, but that he was familiar with the undulations and wave marks on the old beaches laid open in the Jura Mountains.

I need not say what a pleasant drive this was. I had long felt great interest in various departments of Natural History, but had been so fully occupied with my own duties, as a teacher, that I had been able to indulge myself fully, and that for a small part of the year, in one only. Here was a companion who was intimately acquainted with all, and with the most distinguished men who had been advancing them, and who was ready and happy to communicate wealth of information upon every point I could ask about.

Some days after, I invited all the members of this Society to meet Mr. Agassiz at my house. Every one came that could come. They conversed very freely on several subjects, and Agassiz showed the fulness of his knowledge, and his remarkable powers of instant observation. All seemed to feel what a precious accession American science was to receive.

Not long afterwards, Mr. Agassiz accepted an invitation to spend Christmas with us. We took some pains, ourselves and our children, among whom were then two bright boys, full of fun and frolic, one in college, and one nearly prepared to enter. He was easily entertained, entering heartily, joyously and hilariously, into everything, games and all, as if he were still as young as the youngest, but full of feeling, and moved, even to tears, by some poor lines to him and his native land.

My friends, I have thus shown you how intimate I became, for a few weeks, with Agassiz, whom I found the wisest, the most thoroughly well-informed and communicative, the most warm-hearted and the most modest man of science, with whom, personally, or by his works, I had ever become acquainted. I did not keep up that intimate acquaintance, both because I was too busy in my own work, and because I did not deem myself worthy to occupy so much of his time, consecrated, as it was, to science and the good of mankind. The strong impression he made on me, was made on almost all who ever listened to, or even met, him. It is not surprising then, that

The news of the death of Agassiz caused a throb of anguish in millions of hearts. Such a death is a loss to mankind. What death among kings or princes in the Old World, or among the aspirants for power, or the possessors of wealth, in the New, could produce such deep-felt regret?

He is gone. We shall see his benignant face and hear his winning voice no more; but we have before us his example, and his works. Let us dwell, for a few moments, on some features in his life and character, as an inspiration and a guide, especially to those who mean to devote their leisure, or their life, to Natural History, or to the great work of teaching! What a change has taken place, in the whole civilized world, and especially in this country, in men's estimation of the value and interest of these pursuits, since he began his studies. To whom is that change more due than to Agassiz?

He was endowed by nature with extraordinary gifts. His fascinating eye, his genial smile, his kindliness and ready sympathy, his generous earnestness, his simplicity and absence of pretention, his transparent sincerity;—these account for his natural eloquence and persuasiveness of speech, his influence as a man, and his attraction and power as a teacher. For the development and perfecting of many of his highest and most estimable qualities of mind and character, Mr. Agassiz was doubtless indebted to his noble mother, who, judging from every thing we can learn, was a very rare and remarkable woman. To the quiet, homely, household duties, for which the Swiss women are distinguished, she added, unconsciously, very uncommon mental endowments, which she wisely cultivated by extensive reading of the best authors, and by conversation with the most intelligent persons.

Trained by such a mother, Agassiz grew up in the belief of a Creator, an infinite and all-wise Intelligence, Author and Governor of all things. He was sincerely and humbly religious. During his whole life, while exploring every secret of animal structure, he saw such wonderful consistency in every part, that he never for a moment doubted that all were parts of one vast plan, the work of one infinite, all-comprehending Thinker. He saw no place for accident, none for blind, unthinking, brute or vegetable selection. Though he was a man of the rarest intellect, he was never ashamed to



look upwards and recognize an infinitely higher and more comprehensive Intellect above him.

In his earliest years and through childhood, he was surrounded by animals, — fishes, birds and other creatures, — which he delighted to study, and with whose habits and forms he thus became perfectly familiar. His education, in all respects, was very generous and thorough. He spent his early years in some of the most distinguished schools and colleges in Germany; and he had the good fortune to be made early a student of the two great languages of ancient times. He became familiar, by reading them in their native Greek, with the high thought and reasoned truth and graceful style of Plato, and the accurate observations and descriptions of Aristotle, the nicest observer of ancient times, and justly considered the father of natural history. Probably no work has been more suggestive to him than Aristotle's *History of Animals*; and probably his own breadth of conception and largeness of thought, upon the highest subjects, were due, in no inconsiderable degree, to his early familiarity with Plato. He also read some of the best Latin authors, and wrote the language with great ease.

No one who, early, has the time and opportunity, and who desires to become a thorough naturalist, or a thinker on any subject, should neglect the study of these two languages. From them we borrow nearly all the peculiar terms of natural science, and find the originals of almost all the words which we use in speaking on ethical, metaphysical, æsthetical and political subjects, and no one can be sure that he perfectly understands any of these words unless he knows them in their original language.

I dwell upon this subject, because I believe that the early study of language, especially of the ancient languages, is far too much undervalued. We use language, not only in our communication with others, but in our own thoughts. On all subjects of science, or whatever requires accurate thought, we think in words, and we cannot think, even within ourselves, upon any subject, without knowing the words to express our thoughts. He, who is most fully and familiarly acquainted with the richest language and the thoughts that have been expressed by it, has the power of becoming not

only a good thinker but an eloquent speaker. No greater mistake can be made, in the early education of the future naturalist, than the neglect to give him a full and familiar acquaintance with the words by which thought can be carried on or communicated.<sup>1</sup>

Agassiz's mother-tongue was French, but both this and German were in common use in the Pays de Vaud. He lived, for years afterwards, in several parts of Germany, and thus attained, without special study, the rich language which we Americans have to give so much time to acquire; and he lived, long, a studious and laborious life in Paris, where he became intimately acquainted with Cuvier and other distinguished naturalists, and perfectly familiar with the French language in its best form. More than once, when he was putting his note-book into his pocket, he told me he knew not whether he had made his notes in German or in French.

Agassiz's universality of study and thought suggest a precious lesson. It is never safe to give one's self entirely to one study or to one course of thought. The full powers of the mind cannot so be developed. Nature is infinite; and a small part of one kingdom cannot be understood, however carefully studied, without some knowledge of the rest.

Neither must a man allow himself to be a mere naturalist. Every man ought to seek to form for himself, for his own happiness and enjoyment, the highest character for intelligence, and for just and generous feeling, of which he is capable. He is not a mere student of a department of nature. He is a man; he must make himself a wise, generous and well-informed man, able to sympathise with all that is most beautiful in nature and art, and best in society. It would be a poor, dull world, if all men of talent were to educate themselves to be mere artisans, mere politicians, or mere naturalists.

<sup>1</sup> It is a matter of the greatest satisfaction that the only true mode of learning language, the natural one, by word of mouth from living teachers, is becoming common; the language itself first, and afterwards the philosophy of it—the rules. It is most desirable that this mode of learning the ancient languages should be introduced, to learn first the language, to read and understand it, and afterwards the rules. Indeed I would not recommend the study even of Greek, if most or much of the time given to it had to be thrown away upon the grammar. The true mode, Agassiz' mode of teaching on all subjects, is becoming more and more common.

Agassiz took a large, comprehensive view of the whole field of natural history; his thorough education and intimate acquaintance with the works of the highest men in several walks, Von Martius, Cuvier, Humboldt, and others, made it possible for him to do it, and he then fixed on certain departments, and, for the time, he gave himself entirely to one.

As a future inhabitant of America, it was fortunate for him to have been born, and to have grown up, in one of the free cantons of Switzerland. He was thus accustomed to treat men as equals; and thus his perfect familiarity and his freedom from all assumption were as natural to him as they were graceful and winning. He looked down upon none, but felt a sympathy with every thing best in every heart. The reality of these great human qualities gave a natural dignity which his hearty and ready laugh could never diminish. Every one was drawn toward him by what was best in himself. With the greatest gentleness he united a strong will, and with a resolute earnestness, untiring patience. His great object was truth, and, as he never had any doubt that it was truth, he may have been impatient, but he never felt really angry with those who opposed it.

Mr. Agassiz had, for several years, the great advantage and privilege of being an assistant, in the description and delineation of fishes from Brazil, to Von Martius, the genial and eloquent old man of Munich. In him he had the example of a man, who, with great resources as a naturalist, had, for many years, given himself, in a foreign country, to the study of a single department of Botany, without, however, shutting his eyes to any thing that was new and remarkable in any page of Natural History. To one who was a good listener and never forgot what he heard, what a preparation must this have been for his own expedition, many years after, to the sources of the Amazon, to which he was invited by the Emperor of Brazil, in which he was assisted by the princely aid of his own friends, and from which he brought home a greater number of new species of fresh water fishes than were ever before discovered by one individual, thus carrying forward that work upon the fishes of Brazil, his first work, which he had published when he was twenty-two years old.

He spent the leisure of several years in examining the reefs



and dredging in the waters of the coast of Florida and other parts, always bringing home stores of new species and genera, and completing the history of innumerable known ones. What a preparation were these years for the great Hasler expedition, in which the depths of the ocean were very fully explored, and innumerable objects, new and old, were brought up, showing that the bottom of the ocean is any thing but barren, and throwing new light upon the geology of recent and of ancient times.

Whenever Mr. Agassiz undertook a special work, he prepared himself for it by a careful study of whatever had been done in that particular line by all others. He had seen, everywhere, indications of the action of ice. He determined to investigate. He began by reading all he could find upon the subject, and then set himself to observe, patiently and carefully, what was taking place in the glaciers themselves. He gave the leisure of several years to this examination, and then felt himself ready to observe the effects of similar action in former ages and distant regions. The opinions of such an observer, after such a preparation, cannot be without authority and value; and it is not surprising that he should not himself have been willing to yield them to those of others who had never given the same study to the subject.

When he wrote his wonderfully complete work upon the American Testudinata, he began by studying whatever had been written in regard to that family of animals, and he furnished himself, by the liberal aid of many friends, with immense numbers of specimens, so that he had ample means of satisfying himself in regard to almost every question that could be asked, as to structure<sup>1</sup> or habits. Such a work will not need to be done over again for many years. It can never be entirely superseded except by a work showing greater diligence, greater fidelity and better powers of nice observation and faithful description.

Let no one who has not carefully examined this, and his other papers in the "Contributions to the Natural History of the United States," venture to speak of his incompleteness.

<sup>1</sup> In speaking of the thorough execution of the works in the four volumes, we ought not to forget the aid he received from the exquisite skill in drawing and engraving of Sonrel, who wore out his eyes in the work, and of Burckhardt and Clark.

His example as a teacher has been of inestimable value, as showing the importance of the best and largest possible preparation, teaching by things really existing and not by books, opening the eye to the richness and beauty of nature, showing that there is no spot, from the barren sea-beach to the top of the mountain, which does not present objects attractive to the youngest beginner, and worthy of, and rewarding, the careful consideration of the highest intellect.

The town of Neufchâtel, near which Mr. Agassiz was born, and particularly the hills behind it, give fine views of natural scenery. From a hill, not two miles from his former home, I had a view of the lake and the plains and mountains beyond, which I now recall as one of the widest, most varied and most exquisite, I have ever seen. Agassiz thus grew up to a love of the beautiful.

This love of the beautiful in nature has been increasing from the most ancient times to the present. It is more generally felt and more fully enjoyed now than ever before, and in this country, apparently, more than in any other. More persons leave the cities, as soon as they begin to grow warm and dusty, to enjoy the country or the seaside, the mountains or the lakes; and they enjoy rationally and heartily. Who has done more than Agassiz to increase this enjoyment? With thousands, it is becoming not merely the enjoyment but the study of the beautiful. Collections of shells, curious animals, minerals, sea-weeds, and flowers, are becoming, like libraries, not only sources of pleasure to the eye, but of delightful study, whereby a nearer approach is made to the very fountain of enjoyment; we not only see and feel, we begin to understand. The more we see of the uses, of the wonders, of the structure, the more profound is our enjoyment? Who has done more than Agassiz to awaken this enjoyment?

In 1855, with the aid of Mrs. Agassiz, who, from the beginning, did a great deal of the work, Mr. Agassiz opened a school for young ladies. For this he was, in all respects, admirably well qualified. The charm of his manner, his perfect simplicity, sincerity and warm-heartedness, attracted every pupil, and won her respect, love and admiration. He knew, almost instinctively, what we teachers have to learn by

degrees, that we cannot really attract, control and lead a child, and help to form his habits and character, without first loving him; that nothing in the world is so powerful as real, disinterested affection. He gave, himself, by lectures most carefully prepared, an hour's instruction, real instruction, every day. All his pupils retain their respect and love for him, and some keep the notes they made of his talks, and read them with delight. The school was continued for seven years, with great success, attracting pupils from distant parts of the country.

One of the secrets of his success as a teacher was, that he brought in nature to teach for him. The young ladies of a large school were amused at his simplicity in putting a grasshopper into the hand of each, as he came into the hall; but they were filled with surprise and delight, as he explained the structure of the insect before them, and a sigh of disappointment escaped from most of them when the lesson, of more than an hour, closed. He had opened their eyes to see the beauty of the wonderful make of one of the least of God's creatures. What a lesson was this to young women preparing to be teachers in the public schools of the Commonwealth, showing that in every field might be found objects to excite, and, well explained, to answer, the questions, what? and how? and why? which children will always be asking.

He had all the elements necessary to an eloquent teacher: voice, look and manner, that instantly attracted attention; an inexhaustible flow of language, always expressive of rich thoughts, strong common sense, a thorough knowledge of all the subjects on which he desired to speak, a sympathy with others so strong that it became magnetic, and a feeling of the value of what he had to say, which became and created enthusiasm. He thus held the attention of his audience, not only instructing and persuading them, but converting them into interested and admiring fellow students.

His mode of teaching, especially in his ready use of the chalk and the blackboard, was a precious lesson to teachers. He appealed at once to the eye and to the ear, thus naturally forming the habit of attention, which it is so difficult to form by the study of books. Whoever learns this lesson will soon find that it is the teacher's part to do the study, to get com-



plete possession of what is to be taught, in any subject, and how it is to be presented, while it is the part of the pupils to listen attentively and to remember. This they will easily do, and, to show that they do remember, they may be easily led to give an account, in writing, of what they have heard. Every lesson will thus be not only an exercise of attention and memory, but a lesson in the English language, proper instruction in which is very much needed and very much neglected. Whenever a pupil does not fully understand, the teacher will have the opportunity, while he is at the black-board, of enlarging and making more intelligible.

Wherever the teacher shall be successful in adopting this true and natural mode of teaching, the poor text-books which now infest the country will be discontinued, and those who now keep school will become real teachers; school keeping will be turned into teaching. When this method is fairly introduced, we shall hear no more of long, hard lessons at home, nor of pupils from good schools who have not learned to write English.

The advent of Agassiz is to be considered a most important event in the Natural History of the country. The example of his character, his disinterestedness, his consecration to science, his readiness to oblige even the humblest and most modest, his superiority to self-interest, his sincerity and absence of all pretention, his enthusiasm in all that is noble—all these recommended not only him, but the science he professed. Never was a life more richly filled with study, work, thought; and all was consecrated, not to the benefit of himself, but to the promotion of science for the good of his fellow creatures.

For many years Mr. Agassiz has seemed to live only for the advancement of natural history, by the building up of his Museum, for which he had collected materials, of the greatest possible diversity, which would, properly cared for and arranged, form a Museum superior in numbers and variety to any similar collection in the world. Shall this great work be allowed to fail?

Let every person who honors the memory of Agassiz, say No! Let every one who regrets that the great main support of the noble structure is taken away, resolve that it shall not

fail, BUT that, so far as depends on him and what he can do,  
IT SHALL GO ON AND BE BUILT AND FILLED,  
AND STAND FIRM, A GLORIOUS TEMPLE OF  
SCIENCE FOREVER.









